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Mr. Arthur G. Gravenstein, P.E.
Bureau of Corrective Actions -- Remediation Branch
Nevada Division of Environmental Protection
333 W. Nye Lane
Carson City, Nevada 89701

Subject: Response to Comments on the Draft Final Process Areas Work Plan Dated January 14, 2003 and Submittal of Final Process Areas Work Plan

Dear Mr. Gravenstein:

Atlantic Richfield Company appreciates this opportunity to respond to the comments provided by the regulatory agencies on November 13, 2003 for the subject document. The agency comments presented below are also based on Atlantic Richfield's interim submittal of responses dated August 7, 2003 to the regulatory agencies -- Nevada Division of Environmental Protection -- Bureau of Corrective Actions (NDEP), U.S. Bureau of Land Management (BLM) and the U.S. Environmental Protection Agency (EPA). Our interim submittal was based on the meeting held on July 7, 2003 with representatives of NDEP, BLM and EPA.

Atlantic Richfield has made every effort to provide the regulatory agencies with sufficient information in this response letter and the attached Work Plan to allow an initial, but comprehensive, phase of site characterization to be approved. All significant regulatory issues have been addressed and minor concerns on the part of the agencies, if any, may be resolved after the site characterization activities proposed in the Work Plan have been completed and analytical results have been returned.

The most recent comments provided by the regulatory agencies have expressed concern about composite sampling proposed in the Draft Final Process Areas Work Plan. The attached final Work Plan should alleviate such concerns given that the proposed field sampling program will consist only of discrete samples. The sampling program described in the attached Work Plan is based on our current knowledge of the site and historic process operations. Such knowledge consists of a thorough review of all mine site records, researching relevant information at the Mackay School of Mines library and, in part, archived records stored at the University of Wyoming. The result is a comprehensive sampling of locations where soil contamination was most likely to occur (e.g., adjacent to building access points, stained or topographically depressed areas, frequent intervals adjacent to process components). Atlantic Richfield believes this biased sampling program will evaluate "worst-case" conditions and is appropriate because: 1) relatively small-scale Process Area components are under investigation; 2) sufficient historical

and physical information is available for each component; and 3) the objective of the investigation is to screen the Process Areas for the presence or absence of contamination at levels of concern to the regulatory agencies.

In order to ensure that all possible constituents of concern are addressed in this first phase of site investigations, Atlantic Richfield has expanded the list of analytical parameters to be evaluated for each sample location to include the broadest possible use of chemicals within the Process Areas. This approach should resolve any conflict that may arise if concerns remain on the part of the regulatory agencies that the proposed Work Plan is based on imperfect knowledge of all operational activities at the site. Atlantic Richfield also believes that the proposed site investigations will systematically eliminate or confirm the potential for each Process Areas component to pose a threat to human health or the environment.

The proposed site investigations currently include the sub-surface evaluation of the locations of the "first joint" and terminus of all underground utilities known to exist within the Process Areas. In addition to the comprehensive surface and sub-surface soils characterization program described in the attached Work Plan, Atlantic Richfield proposes to conduct the first phase of groundwater monitoring associated with the Process Areas. Instead of installing monitoring wells in lieu of evaluating underground utilities, as described in our submittal of interim responses dated August 7, 2003, Atlantic Richfield now proposes to complement the soils investigations with the first phase of groundwater investigations by installing three wells to: 1) triangulate groundwater flow direction and gradient; 2) collect groundwater quality data up-gradient and within the Process Areas (immediately down-gradient of mapped underground utilities; and 3) collect groundwater quality data from a down-gradient location that is as close as possible to the buried former acid plant (without compromising the integrity of the overlying heap leach pad). Atlantic Richfield proposes to discuss the exact locations, designs and timing of the three initial wells with the regulatory agencies in an upcoming meeting that would also include the overall groundwater conditions associated with the Yerington Mine.

Soil and groundwater samples will include analyses of radionuclides, as described in the attached Work Plan. Atlantic Richfield understands that the regulatory agencies may wish to develop a separate "radionuclide work plan" for the entire site. Atlantic Richfield will work with the regulatory agencies to assess the occurrence of radionuclides at the site, through the Process Areas Work Plan and other related Work Plans (drafts previously reviewed by the agencies), or through the development of a separate "radionuclide work plan".

In summary, Atlantic Richfield believes the attached final Process Areas Work Plan has been substantially improved over previous versions for the following reasons:

- Increased number of biased sample locations focused on "worst-case" conditions anticipated at the site, including a significant increase of locations along the calcine ditch;

- Use of only discrete samples to avoid potential dilution effects for assessment of analytical results relative to Region 9 Industrial PRGs and background values, the latter to be established by Atlantic Richfield and the regulatory agencies;
- Relatively small (3-5 foot diameter) surface-stained areas will be excavated to a depth of up to three feet below ground surface and removed to a controlled storage location for subsequent disposal, which will allow for sampling at depth and limited delineation and immediate remediation of small manageable areas of soil contamination;
- Analyses for a comprehensive suite of constituents from all samples to avoid potential conflict over the degree of site knowledge used in developing the Work Plan;
- Radionuclides will also be analyzed where process fluids were conveyed, stored or used;
- Inclusion of sub-surface sampling of mapped underground utilities at the “first-joint” adjacent to buildings and their termination points;
- General consistency with the template provided by BLM in previous comments, so that sampling and analytical procedures are conducted to achieve the data quality objectives of the Work Plan;
- The addition of three monitoring wells to establish initial groundwater flow and quality information associated with the Process Areas, including the buried former acid plant;
- Recognition that, pending the results of the sampling and analysis plan proposed in the Work Plan, subsequent horizontal and vertical delineation sampling may be required as a second characterization phase to fully evaluate the potential risk to human health and the environment and close the Process Areas in a manner consistent with applicable regulations; and
- Deletion of references to other Work Plans that have not been approved and addition of references to support the proposed sampling and analysis plan for the Process Areas.

General and specific agency comments are numbered and presented below, followed by our italicized responses with specific references to pages within the attached Final Work Plan that have been edited. The two sets of general comments provided by the regulatory agencies are divided into two groups.

General Comments (Group 1):

General Comment no. 1: Many of ARC's responses to the agencies comments indicate that the forthcoming final work plan will contain the necessary information that addresses the agency comments. The agencies anticipated that this information would be included in this recent submittal; however, we will make a final determination when the final work plan is submitted for our review.

Response to General Comment no. 1: As described above, Atlantic Richfield anticipates that the necessary information that addresses the agency comments is provided in the attached Work Plan.

General Comment no. 2: One major issue to be corrected is in ARC's responses that indicate modifications to sub-surface sampling were agreed to by the agencies at the July 7 meeting. ARC indicates in their August 7, 2003 responses that at the July meeting, the agencies agreed to allow ARC to forgo all subsurface sampling and replace that sampling with the installation of a number of monitor wells. The agencies did not agree to this modification. At the July meeting, ARC's proposal was to install a number of monitor wells in lieu of investigating underground utilities. In order for this proposal to be accepted, ARC would have to include the appropriate rationale to support this proposal. The Agencies expect to see detailed subsurface sampling, including areas of suspected or known underground utilities, and supporting rationale for all components potentially sourcing CoCs in the Process Areas to be included in the final work plan. Without appropriate subsurface sampling and rationale, the work plan cannot be approved.

Response to General Comment no. 2: Atlantic Richfield proposes to conduct detailed sub-surface sampling as described in (Sec. 3.0, pg. 39 and Sec. 3.1, pg. 42) of the attached Work Plan. Sub-surface evaluation of the locations of the "first joint" and terminus of all underground utilities known to exist within the Process Areas will provide the detection phase of the investigation in locations that are most likely to be impacted through underground piping. As part of the proposed phased approach to characterization of the Process Areas, as described above, additional horizontal and vertical delineation sampling may be conducted pending the results of the proposed initial phase of surface soil sampling (Sec. 3.1 pg. 46).

Additional characterization/remediation will also be achieved by the excavation of relatively small (3-5 foot diameter) surface-stained areas to a depth of up to three feet below ground surface. The excavated material will be removed to a controlled storage location and characterized for subsequent disposal within 30 days. It is proposed that excavated materials could be stored in one of the P.A. buildings so that the soil will not be impacted by stormwater run-on or run-off. Two Confirmation samples will be collected from each excavation at the base of the bottom and side walls of the excavation for comparison to appropriate analytical trigger levels to determine if additional excavation during the next phase of the investigation will be required (Sec. 3.1, pg. 45). This will allow remediation concurrent with characterization to resolve potential issues associated with the interpretation of analytical results of obviously stained areas and allow for a systematic approach to removing areas of obvious environmental concern.

Based on the analytical results of the initial phase of sampling described in the attached Work Plan, Atlantic Richfield will discuss the need for additional horizontal and/or vertical delineation of site soils affected by operations and process fluids. Additional sub-surface

sampling may be conducted as a second phase of site characterization of the Process Areas to further delineate surface impacts defined as part of the first phase (Sec. 3.1, pg. 45 and 46).

Preliminary monitoring of groundwater associated with the Process Areas will also be conducted, as described in the attached Work Plan (Sec. 3.1, pg. 47 and 48). However, Atlantic Richfield proposes that the timing of this will be decided in an upcoming meeting with the regulatory agencies given the strong link between potential environmental effects associated with the Process Areas and overall groundwater conditions at the site. The monitoring proposed in the attached Work Plan may be conducted in conjunction with the groundwater characterization program described in the Draft Final Groundwater Conditions Work Plan, to be finalized after the proposed meeting with the regulatory agencies. One approach that may resolve ongoing concerns regarding coordination of the various Work Plans would be to include all references to groundwater in both reports. While this approach may result in some redundancy, it has the potential to link the Work Plans in a manner that will facilitate a logical review of both documents.

General Comment no. 3: Location of Sub-Samples and Composite Samples - The use of sub samples and their composites needs to take into account the differing potential usage of an area and the distance between samples. The use of sub-samples needs to take into account possible variation in use of potential contaminants in a component area and if adequate historical justification is not available should take a conservative approach. Therefore proposing the collection of two sub-samples by one doorway and two sub-samples by a different doorway and then a fifth sample behind the building is not appropriate unless documentation is available to indicate the use of similar contaminants in all three areas.

Response to General Comment no. 3: Atlantic Richfield proposes to conduct detailed surface sampling using discrete samples as described in (Sec. 2.2, pg. 10, Sec. 3.0, pg. 39-42, Sec. 3.1, pg 43-77 and Table 1) of the attached Work Plan. Judgemental samples consistent with EPA Guidance document QA/G-5S to evaluate potential "worst-case" soil impacts associated with all process components are proposed and, based on the comments by the regulatory agencies, composite samples have been eliminated from the Work Plan. This approach will promote confidence by all stakeholders that the results of the phased characterization program will support a defensible assessment of human health or ecological risks and a final permanent closure plan for the Process Areas.

General Comment no. 4: Holding Times - Holding times need to taken into account when proposing to collect sub-samples and compositing them and only analyzing the sub-samples when an exceedance is seen. In some analytes such as metals such an approach may be viable but in the case of analytes such as VOCs does not seem appropriate.

Response to General Comment no. 4: Given the revised approach to site characterization at the Process Areas, using phased sampling and analysis and discrete samples, the potential holding-time issue has been resolved and should no longer be a factor. All samples will be handled according to the agency-approved Quality Assurance Project Plan for the site dated September 19, 2003. No composite samples will be collected (Sec. 3.1, pg. 44).

General Comment no. 5: Contamination in Interior of Structures - This proposed approach does not address contaminants inside of structures unless an obvious stained area or sump is encountered. How will this approach provide the information necessary to make the decision as to whether more data is needed to determine if this portion of the site is clean enough for closure? All drums and containers of potential contaminants have been removed from inside buildings. Once the buildings have been removed they will no longer present any exposure pathway. Any work plan for demolition and removal of buildings should address inhalation exposure pathway during removal activities.

Response to General Comment no. 5: Additionally Atlantic Richfield proposes to address this issue by conducting sub-surface sampling of underground utilities and drains at the exit point of each building, and at the terminus of such underground conveyance features (Sec. 3.1, pg. 46). This approach, as part of the first phase of site characterization at the Process Areas, will enable Atlantic Richfield and the regulatory agencies to determine if additional sampling beneath buildings or piping is necessary as part of a subsequent phase. Following completion of the first phase of the Process Areas investigation and evaluation of analytical results, Atlantic Richfield proposes to meet with the regulatory agencies to discuss the need, timing and approach for any subsequent characterization beneath buildings, piping or other structures.

General Comment no. 6: Use of Composite Samples and Potential Dilution Effects - Comparison of soil samples to Region 9 Preliminary Remediation Goals (PRGs) is an appropriate approach when comparing discrete samples. Comparison of five point composites to PRG values will potentially result in missing contaminants at greater than 5X the PRG value due to the dilution of lower concentrations. How can an adequately protective approach be ensured?

Response to General Comment no. 6: Atlantic Richfield agrees with this comment and has eliminated composite sampling from the Process Areas Work Plan (Sec. 3.1, pg. 44). As described in the Work Plan DQOs, analytical results from the first phase of soil sampling will be compared to Region 9 Preliminary Remediation Goals (PRGs) and background soil values for naturally occurring constituents, provided in the attached Work Plan, to determine if a second phase of soil sampling, including horizontal and vertical delineation sampling, is required (Sec. 1.4, pg. 5). In addition, Atlantic Richfield proposes that EPA-approved soil concentration values from other sites, such as the Anaconda Smelter NPL Site in Anaconda, Montana ("Record of Decision of Community Soils"), may also be evaluated for use in comparing analytical results

from the Process Areas. The elimination of composite samples would eliminate the concern over potential sample dilution.

General Comment no. 7: Groundwater Monitoring Approach and Impacts - The use of groundwater monitoring wells on the perimeter of the Process Components Areas may reduce the number of soil samples and reduce the uncertainty of unknown utilities however it does not take into account those potential sources that have not had adequate time to migrate to the perimeter of the areas or those that may not be mobile enough to have migrated such as PCB contaminated hydrocarbons from a leaking subsurface utility. Therefore this approach implies that some sort of institutional controls for the Process Area Components may always be required which would impact future land use.

Response to General Comment no. 7: Atlantic Richfield agrees with this comment and has modified the Work Plan to address this concern by proposing to conduct a phased approach to source area investigation and delineation (Sec. 1.4, pg. 5). Both sub-surface sampling and initial groundwater monitoring well installations have been included in the attached Work Plan (Sec. 3.0, pg. 41 and Sec 3.1, pg. 46-49). The comprehensive and phased site investigation approach proposed by Atlantic Richfield in the attached Work Plan will provide the regulatory agencies and all stakeholders with sufficient information to assess human health or ecological risks, and develop a final permanent closure plan for the Process Areas. Not only will the groundwater pathway be considered in developing the final permanent closure plan, but air and other media pathways as well. All soil samples collected at or below the surface during the first phase of investigations will be analyzed for the full range of constituents discussed with the regulatory agencies (Sec. 3.1, pg. 44). In addition, process components where technically-enhanced naturally-occurring radioactive materials (TENORM) may have been concentrated will be analyzed for radionuclides. Groundwater samples from the three proposed monitoring wells associated with the Process Areas will also be analyzed for the full suite of constituents and radionuclides (Sec. 3.1, pg. 44).

General Comment no. 8: Ambient Background Determination - EPA has repeatedly stated that background should be discussed thoroughly within one of the Yerington Technical Work Group meetings. We have also recommended that a range be used and that EPA's background sample, BK-1 (from EPA's 2/2001 sampling effort; please contact EPA if you do not have a copy of this report) be used as one location/value for background. If a sample exceeds a PRG or proposed background the agencies are still able to make site specific decisions regarding whether an area requires further definition. The determination of a technically justified and agreed upon ambient level for the contaminants at this site needs to be completed prior to any comparison of the data. The values from Schacklette and Boerngen (1984) as this reviewer understands them were derived for the conterminous U.S. and various subregions. Their applicability to this site would need to be determined and justified.

Response to General Comment no. 8: Atlantic Richfield agrees that background should be discussed with the Yerington Technical Work Group, or solely with the regulatory agencies. The attached Work Plan includes the analytical results from soil sample BK-1 collected by EPA as potentially representative of soil background concentrations of selected analytes at the mine site (Table 5). Atlantic Richfield concurs that the values from Shacklette and Boerngen (1984) were derived for the conterminous U.S. and various sub-regions, and appreciates this opportunity to clarify that they are provided as a preliminary reference tool for use in evaluating soil background ranges that may be anticipated to occur at the Yerington Mine Site for the purpose of understanding analytical results and actual background samples, when collected.

General Comments (Group 2):

These comments on the Response to Comments follows the numbering format with corresponding comment titles used in Response to Comments dated August 7, 2003 on the Draft Final Process Area Work Plan for the Yerington Mine Site dated January 14, 2003).

General Comment no. 1: Page 2, Response to General Comment No.3 -- The forthcoming Final Process Areas Work Plan provide the requested justification and information, as discussed during the July 7, 2003 meeting.

The original comment noted that ARC must provide justification for the sampling methods, locations, and analytes at each potential source area along with historical and scientific justification for the proposed characterization. Although the revised Table 1 Process Area Sampling Schedule does provide an abbreviated rationale for sample locations and analyses, please note that final evaluation of the sufficiency of the response will be dependent on the requested justification and information in the forthcoming Final Process Areas Work Plan.

Response to General Comment no.1: The information presented in Table 1 in the attached Work Plan summarizes the rationale for the proposed sampling and analytical activities for the Process Areas (Table 1, Sec. 2.2, pg. 10, and Sec. 3.0, pg. 39-40). Given that Atlantic Richfield has agreed to sample "worst-case" site conditions with a substantially increased number of discrete soil samples and an extensive analytical suite for each sample (including radionuclides for components where process solutions were used stored or conveyed), Atlantic Richfield believes that the rationale presented in Table 1 should be sufficient to resolve any issues that may arise if concerns remain on the part of the regulatory agencies that the proposed Work Plan is based on imperfect knowledge of all operational activities at the site. The proposed site investigations should systematically characterize each process component to achieve the data quality objectives (DQOs) for the Process Areas (Sec. 1.4, pg. 4).

General Comment no. 2: Page 3, Response to General Comment No. 5 -- This response continues to indicate that composite samples will be submitted for VOC and TPH analysis.

Again, as mentioned in previous comments, this is not the appropriate type of sampling and analysis for these particular CoCs. Archiving of sub-samples for potential future analyses will obviously depend on turn around times for analyses and specific holding times for certain CoCs, so ARC must consider potential re-sampling.

The 20 discrete "opportunistic" sample locations as proposed are confusing. For example, why are the locations and number of samples already indicated? And what is the significance of limiting the amount to 20? What is the rationale? What would happen if 20 "opportunistic" samples are taken and there are other areas that are suspicious in nature and are then identified as areas that require sampling, would they be sampled? If these samples were truly "opportunistic" then these samples could be taken where deemed necessary without any limitation.

As stated earlier, a number of monitor wells were to be proposed, along with the appropriate rationale, in lieu of sub-surface sampling of the utility lines only and were not intended to replace all subsurface sampling for all process areas components. Detailed subsurface soil sampling will have to be presented in the final work plan. Please refer to the "BLM Sample of Yerington Mine Process Areas Work Plan Outline, April 14, 2003" for examples of the type of sampling information to be included in the final work plan. This BLM outline was included as an attachment to the July 9 NDEP letter.

What is the rationale behind the proposal that one out of twenty samples will be analyzed for radionuclides? Areas that have a high probability for contamination would be the areas where samples would be taken (subsurface as well). For example, would the Administration building be the one sample that is taken and sent to a lab for analysis? Would the Assay building be the one where no sample would be submitted for analysis? Would the calcine ditch be excluded as well because it is not the one in twenty? What if the sample that has been submitted for analysis comes back positive for radionuclides, would the area be re-sampled? Would the sample area be expanded? Would groundwater be included in the re-sampling? Based upon the historical information that we recently obtained, all samples, including groundwater samples, will need to be analyzed for radionuclides.

Response to General Comment no.2: Atlantic Richfield has revised the attached Work Plan to provide the rationale for sample locations (Table 1, Sec. 2.2, pg 10, Sec. 3.0, pg. 39-40). In addition, the regulatory agencies may participate in the site investigations to promote a collaborative approach to making field-based decisions that may modify the revised sampling and analysis plan, if conditions dictate a logical change to the proposed sampling locations. The phased approach for site investigations associated with the Process Areas should also alleviate the concerns raised by this comment. Opportunistic samples are no longer proposed. In their place, many more "worst-case" discrete sample locations have been proposed (Sec. 3.0, pg. 39). In addition, to be consistent with the referenced BLM outline, sub-surface sampling is proposed at the "first-joint" and terminus locations for each mapped underground utility (Sec. 3.1, pg. 46). The phased approach to soils sampling in the Process Areas, with potential additional horizontal and vertical delineation of impacts, should also alleviate any concerns with the proposed sampling and analysis plan. Proposed sub-surface investigations of underground

utilities, which generally follow the outline provided by BLM in previous comments, will characterize any soil impacts from these potential sources.

The rationale for radionuclide analyses will be to analyze for radionuclides for each sample collected from a component where process solutions were stored, used or conveyed, as these are the areas where TENORM would be encountered (e.g., not associated with a garage or warehouse). Atlantic Richfield recognizes that the regulatory agencies may elect to consolidate all such analyses in a site-wide "radionuclide work plan" that addresses sampling and analysis from all mine units, and will work with the agencies to facilitate such an approach (Table 1 and Sec. 3.1, pg. 44).

General Comment no. 3: Page 3, Response to General Comment No.5: 1st Bullet -- Surface sampling will be conducted as follows for each point located on the revised figures: 1) Collect five sub-samples (each 0-12 inch depth); 2) composite equal weight portions of all five sub-samples into one composite sample to be submitted for one or more specific analyses (e.g. whole rock, VOCs, TPH) per the revised Table 1; and 3) each of the sub-samples will be archived for potential future analyses dependent upon the results. In addition,...

How will this proposed approach take into account those analytes such as VOCs that have a relatively short holding time of 14 days following sampling? And how will the regulatory agencies be involved in such decision making activities? There should also be a potential for further sampling at depth based upon the results of the archived samples.

Response to General Comment no.3: Please see response to General Comments nos. 3 and 4 from the first group of comments. The approach to Process Areas sampling follows EPA Guidance Document EPA QA/G-5S and the agency approved QAPP (Sec. 2.2, pg. 9-10). Judgmental sampling program described in the attached Work Plan is based on our current knowledge of the site and historic process operations. Such knowledge consists of a thorough review of all mine site records, researching relevant information at the Mackay School of Mines library and, in part, archived records stored at the University of Wyoming. The result is a comprehensive sampling of locations where soil contamination was most likely to occur (e.g., adjacent to building access points, stained or topographically depressed areas, frequent intervals adjacent to process components) (Sec. 3.0, pg. 39-40). Atlantic Richfield believes this biased sampling program will evaluate "worst-case" conditions and is appropriate because: 1) relatively small-scale Process Area components are under investigation; 2) sufficient historical and physical information is available for each component; and 3) the objective of the investigation is to screen the Process Areas for the presence or absence of contamination at levels of concern to the regulatory agencies (Sec. 2.2, pg. 9-10).

General Comment no. 4: Page 3, Response to General Comment No.5: 4th Bullet -- Analytical trigger levels based upon the EPA Region 9 Preliminary Remediation Goals (PRGs) or some other appropriate screening level will be presented in the forthcoming Work Plan for potential COCs in soils. The analytical trigger levels will be used to evaluate whether the sub-samples archived from the sampling activities should be submitted for laboratory analysis.

Since the selection of appropriate screening levels is a significant component of such a screening level approach, the proposal of alternate screening levels will need to be adequately documented and justified. When using a sampling approach which relies on the use of composite sampling and the use of perimeter monitoring wells to evaluate migration from potential subsurface source areas rather than subsurface sampling as proposed, the need for appropriate screening levels is critical and key to approval of the work plan.

Response to General Comment no.4: Given the revised phased sampling and analysis approach presented in the attached Work Plan and described above, the use of EPA Region 9 Industrial PRGs, background samples (the latter to be defined as site-wide sampling continues and analytical results are available), or other values from EPA-approved sites should adequately serve as analytical trigger levels for subsequent phases of the investigation. Analytical results for discrete samples can be directly compared to the PRGs, background soil values (once established) and trigger levels from other EPA sites (e.g., Anaconda Smelter Site) to determine if subsequent horizontal and vertical delineation is required at any one sample locations without concerns over dilution or holding times (Sec. 3.0, pg. 40). The phased sampling approach presented in the attached Work Plan is focused on source identification, which would either be accomplished during the site investigations proposed in the attached Work Plan or during a subsequent characterization phase, as required.

General Comment no. 5: Page 4, Response to General Comment No.5: Bullet 6 -- In lieu of ... Based upon the results of the groundwater monitoring and surface soils sampling, the need for sub-surface soils sampling will be evaluated based upon risk.

How will such an evaluation be made regarding the need for sub-surface soils sampling based on risk be conducted if there is not adequate data collected to sufficiently characterize the site or to conduct a baseline risk assessment? The use of risk based screening level criteria such as PRGs is appropriate but even that approach will need to meet the statistical and data requirements of any risk based approach.

Response to General Comment no.5: The attached Work Plan presents a comprehensive site characterization program that includes discrete surface sampling, additional horizontal and vertical delineation sampling as necessary, sub-surface sampling associated with underground utilities and initial groundwater monitoring. The data derived from the proposed sampling and analysis program should provide all necessary information to evaluate risks and develop a

defensible closure plan for the Process Areas (Sec. 2.2, pg. 9-10, Sec. 3.0, pg. 39-42, and Sec. 3.1 pg. 42-49)

General Comment no. 6: Page 4, Response to General Comment No.5, Bullet 7 -- Radionuclides (gross alpha, beta and uranium) in Process Areas soils will be analyzed at a frequency of one out of 20 samples shipped to the laboratory for whole-rock analysis. Collected samples will be screened for gamma radiation with a scintillation detector (e.g. Victoreen model 450B Ion Chamber Survey Meter) and samples with the highest reading will be analyzed for gross alpha, beta and uranium. If possible, the samples selected for radionuclide will be distributed geographically throughout the Process Areas.

Based on the new information indicating potentially widespread uranium mineralization at the site, of sufficient quantity to consider the economic feasibility of uranium production in 1976, the proposed approach is inadequate to address the radiological contaminants at the site. Attempting to narrow the scope of investigation before better understanding the distribution and variability could result in missing hot spots. Therefore, all of the samples collected from soils, surface water and groundwater should be screened with appropriate radiological investigative approaches.

Such approaches at a minimum should consist of gamma ray screening of soil samples with confirmation sampling of anomalous samples (anomalous samples would be those exhibiting values 2X site specific background or a similar statistical approach). Also a statistically significant percentage of the total samples will need to be submitted for confirmation analyses. Groundwater samples should be analyzed using Total Uranium, Radium 226 and Radium 228.

A key factor in evaluating any potential risk will be to determine any incremental risk above that from the site specific ambient levels. The determination of ambient levels will need to take into account the geographical distribution as well as the difference in specific soil and rock types and needs to be considered when characterizing distribution of radiological contaminants.

Response to General Comment no. 6: The attached Work Plan presents a revised site characterization program that includes radiological analyses of surface soil samples associated with process fluids (Sec. 3.1, pg. 45) and of groundwater samples from three proposed monitoring wells (Sec. 3.1, pg. 47-49). If additional sub-surface sampling (i.e., vertical and horizontal delineation) is conducted where radionuclide concentrations are determined to be of concern, the sub-surface samples collected during this phase will also be analyzed for radionuclides. Atlantic Richfield agrees with the concept that the determination of ambient radiological concentrations will have to consider site-side geographical and lithological variables. The determination of site-wide background or ambient concentrations will be conducted through the implementation of a "radionuclide work plan" or the implementation of the Process Areas Work Plan and other companion Work Plans that include radionuclide sampling and analysis of solid materials (Sec. 3.1, pg. 45). Atlantic Richfield requests that the

regulatory agencies discuss the preferred approach for site-wide radionuclide investigations.

General Comment no. 7: Page 4, Response to General Comment No 6: BLM's previous comments and suggestions for this work plan need to be addressed by ARC in the final work plan.

Response to General Comment no.7: Atlantic Richfield believes that the attached Work Plan addresses BLM's previous comments and suggestions.

General Comment no. 8: Page 4, Response to General Comment No.7 -- All specific locations of revisions cannot be referenced in this response to comments letter since it is being submitted prior to the revised Work Plan. Atlantic Richfield suggests that a redline-strikeout version of the forthcoming Work Plan may be useful in reviewing document revisions, and can be provided upon request.

While the point made in regards to this response to comments letter and the forthcoming Work Plan may be appropriate for this atypical situation, nonetheless in other documents, please include the location or locations of all revisions to speed the review process. To avoid unanticipated delays in particular those resulting from poor quality documents such a simple approach is an efficient way to expedite the process.

Response to General Comment no.8: Atlantic Richfield concurs and has attempted to include the location or locations of all revisions to facilitate agency reviews of Work Plans.

General Comment no. 9: Page 5, Response to General Comment No.8 -- The forthcoming Process Areas Work Plan will be revised to reflect that, as part of the proposed field investigations, Atlantic Richfield will evaluate the risk posed by the possible existence of the transfer points through surface soil sampling and laboratory analyses that will be conducted at these locations pending field observations. Furthermore, the groundwater data to be collected as part of the monitoring well installation and monitoring program associated with the Process Areas will provide additional information on the risk posed by the transfer points.

Does the decision point of field observations refer only to soil discoloration or positive identification of location also? How will the risk be evaluated unless the data collected consists of statistically significant sampling and data quality or is the determination to be qualitative? In particular how are disparate data sets which would document disparate exposure pathways to be reconciled in such an approach?

Response to General Comment no.9: The attached Work Plan provides for a comprehensive site characterization program for the Process Areas that should allow for a defensible risk assessment to be completed, including all potential exposure pathways. Atlantic Richfield has proposed a phased approach to the site investigation to allow for further data collection where warranted (Sec. 1.4, pg. 5). Atlantic Richfield proposes to discuss the risk assessment approach after all analytical data has been collected and evaluated.

General Comment no. 10: Page 5, Response to General Comment No. 10 -- Radionuclides (gross alpha, beta and uranium) in Process Areas soils will be analyzed at a frequency of one out of 20 samples shipped to the laboratory for whole-rock analysis. Collected samples will be screened for gamma radiation with a scintillation detector (e.g. Victoreen model 450B Ion Chamber Survey Meter) and samples with the highest reading will be analyzed for gross alpha, beta and uranium. If possible, the samples selected for radionuclides will be distributed geographically throughout the Process Areas.

Please see comment on General Comment No.5, Bullet No.7 above.

Response to General Comment no.10: Please see response to General Comment No.5, Bullet No.7. The attached Work Plan presents a comprehensive site characterization program that includes radionuclide analyses for discrete surface samples associated with components where process solutions have been stored, conveyed or used. These locations are located in specific portions of the Process Areas. Atlantic Richfield does not anticipate analyzing for radionuclides from samples where TENORM do not occur at the site (e.g., adjacent to the Administrative Building or Truck Shop) (Sec. 3.1, pg. 45).

General Comment no. 11: Page 6, Response to General Comment No. 12: Atlantic Richfield is confident that all exposure pathways associated with the Process Areas will be evaluated based on the data collected from the field investigation described in the revised Work Plan, in conjunction with the data to be collected under the other Work Plans for the site.

The response still does not address the need to ensure that the data collected as part of the investigations will be sufficient to complete risk screening and a risk assessment if necessary. In particular since the Work Plan proposes the need for sub surface soil sampling based on risk along with the evaluation of the risk at transfer points. The use of composite sampling may have significant impact on the determination of risk and its' justification. Finally since all of the Work Plans will require significant revision due to document quality issues it does not seem justified to assume that the data collected under the other work plans will be anything other than supplemental.

Response to General Comment no.11: The attached Work Plan provides for a comprehensive site characterization program for the Process Areas that should allow for a defensible risk assessment to be completed, including all potential exposure pathways. Atlantic Richfield will work with the regulatory agencies to ensure that all Work Plans are coordinated and meet agency expectations (Sec. 2.2, pg. 9-10, Sec. 3.0 pg. 39-42, Sec. 3.1 pg. 42-49).

General Comment no. 12: Page 7, Response to General Comment No. 13: 2nd Paragraph; With respect to records research and employee interviews, Atlantic Richfield has thoroughly inspected all files and records at the mine site and applicable publications available at the Mackay School of Mines library. In addition, Atlantic Richfield is researching the archived Anaconda records at the University of Wyoming in Laramie, Wyoming for relevant information.

As stated above significant new information has been provided by BLM's archival research which indicates potentially widespread uranium mineralization at the site, sufficient to consider the economic feasibility of uranium production in 1976. Such a discovery further supports the need to better evaluate historical information. Additional sources of information potentially exist in the geologic literature outside of the Mackay School of Mines Library and needs to be thoroughly evaluated. Particularly significant will be any information regarding the nature of the occurrence of uranium mineralization; whether it was widespread and disseminated or more concentrated as in vein deposits. The situation indicates that Atlantic Richfield's current research will need to be much more comprehensive than past efforts.

Response to General Comment no.12: The information presented in Table 1 in the attached Work Plan summarizes the rationale for the proposed phased sampling and analytical activities for the Process Areas (Table 1, Sec. 2.2 pg. 10, and Sec. 3.0, pg. 39-40). Given that Atlantic Richfield has agreed to sample "worst-case" site conditions with a substantially increased number of discrete soil samples and an extensive analytical suite for each sample (including radionuclides for components where process solutions were used stored or conveyed), Atlantic Richfield believes that the rationale presented in Table 1 should be sufficient to resolve any research-related issues that may arise if concerns remain on the part of the regulatory agencies that the proposed Work Plan is based on imperfect knowledge of all operational activities at the site. In addition, the phased approach to the site investigations will facilitate the inclusion of additional information.

General Comment no. 13: Page 7, Response to General Comment No.14; Last two sentences -- Based upon the results of the groundwater monitoring and surface soils sampling, the need for sub-surface soils sampling will be evaluated based upon risk. Should sub-surface sampling be deemed necessary upon review of the collected groundwater data, Atlantic Richfield will work with the regulatory agencies to develop a discrete sub-surface sampling protocol.

Please see comment on Response to General Comment No.5, bullet no.6 above. Also will review of the collected groundwater data be after one round of groundwater sampling or after four quarters of sampling? The need for discrete sub-surface sampling should be evaluated as soon as possible to allow adequate site characterization and determine any risk. As stated earlier, sub-surface sampling will have to be presented in the final work plan. See comment 1 above.

Response to General Comment no.13: Please see response to General Comments 1 through 6. Atlantic Richfield is confident that the proposed sampling plan in the attached Work Plan and the phased approach to the site investigations will alleviate the concern raised in this comment.

General Comment no. 14: Page 8, Response to general Comment No. 15 -- The January 14, 2003 Draft Final Process Areas Work Plan described on page 21 how inspection of pipes exiting buildings would be conducted. However the Response to General Comment No. 14 now applies to the investigation of these pipes. Based on historical photographs and maps, Atlantic Richfield has provided the best approximation of the trench alignment on Figure 4. The revised Work Plan will expand on the historical calcine ditch. Sample locations are proposed at the beginning of the ditch (i.e. the former acid plant), and at the end of the ditch. If either location indicates anomalous contamination, the individual sub-samples will be analyzed to help delineate the lateral and if required, vertical extent of impacted soils. Then need for any additional sampling will be determined upon the evaluation of the data.

Based on the description of the calcine ditch as being an unlined surface feature that conveyed calcine solutions along with spent solutions from the copper leaching process the potential for contamination from this feature is significant. Along such a linear feature the use of clustered composite samples as proposed appears to be inadequate and could potential miss areas of leakage along the feature. A more appropriate approach would one similar to the one proposed along the vat leach tanks with sampling along the entire length of the approximated ditch alignment. In particular sampling should be conducted at any locations with a change in alignment or construction of the ditch could create impoundments, overflow or low flow conditions.

The proposed investigation of the "calcine" ditch needs to incorporate, at a minimum, the entire length of the ditch including both lateral and vertical sampling. See comment 1 above. BLM's previous comments and suggestions for this work plan need to be addressed by ARC in the final work plan.

Response to General Comment no.14: The attached Work Plan includes 10 discrete samples to be collected along the approximate 2,000 foot length of the calcine ditch not covered by the heap leach pad (one sample every 200 feet) (Table 1, Figure 4). As for the portion of the ditch underneath the pad, down-gradient groundwater monitoring will be performed to alleviate the need for drilling through the heap liner, and potentially compromising its integrity. The samples

collected from the calcine ditch will be analyzed for the full list of parameters including radionuclides. If analytical results indicate that additional investigations are required based on a comparison to PRGs, background soil values or soil values from other EPA-approved sites, vertical and horizontal delineation will be conducted as part of a second phase of characterization.

General Comment no. 15: Page 9, Response to General Comment No. 18 -- The revised figures in the Work Plan will also provide more clarity.

ARC's response on page 9 seems to indicate that the line drawing for each building will be included, however, on page 16, first paragraph, seems to indicate that these will not be done. What is actually planned?

Response to General Comment no.15: Similar figures presented in the Draft Final Work Plan are presented in the attached Work Plan (Figures 2 through 5). Atlantic Richfield has attempted to provide as much clarity as possible for the sample location figures, given the resolution of the available aerial photography. Atlantic Richfield also proposes to provide detailed photo-documentation of all sample locations and sampling activities to be conducted under this Work Plan.

Specific Comments:

Specific Comment no. 16: Page 12, Response to Specific Comment No. 5; 4th paragraph after Step 7 bullet -- Analytical results from composited soil samples will be compared to analytical trigger levels for metals to determine if composited sub-samples should be subject to individual analyses. The proposed analytical trigger levels for soils analyses include the following EPA Region 9 Preliminary Remediation Goals (PRGs) for industrial sites. Note that the arsenic industrial PRG will be replaced with the higher values of the range of background values for the Yerington areas collected by Schacklette and Boerngen (1984). Also note that EPA issued a Record of Decision on Community Soils at the Anaconda Smelter NPL Site in Anaconda, Montana in September 1996. The risk-based clean-up levels for arsenic at this site were 250, mg/kg for residential, 500 mg/kg for commercial/industrial and 1,000 mg/kg for recreational use.

The Agencies agree that the use of Region 9 PRGs as a screening level criteria is an appropriate approach and appreciates ARC's willingness to consider them in conjunction with any other appropriate screening level criteria. Also the note of the use of higher risk based clean-up levels as described for the Anaconda Smelter NPL site further supports the need to ensure that adequate data is collected of sufficient quality to perform a site specific risk assessment necessary to determine appropriate risk based clean-up levels. Keeping this in mind, how will the use of composite samples when screened against PRGs accomplish this? The use of 5 sub-samples in a composite could potentially result in the composited sample value below a PRG even though

some samples could exceed the PRG criteria but would be offset by the remaining non-detect values? Also in the case of those analytes with a very short holding time such as VOCs, with 14 days, how would the process of first screening the composite sample against a PRG allow the holding time requirements to be met?

The issue raised in the comment illustrates the need for the Yerington Technical Work Group to address the need to establish ambient levels as has been previously noted. We have recommended that a background range be used and that EPA's background sample, BK-1 (from EPA's 2/2001 sampling effort; please contact EPA if you do not have a copy of this report) be used as one location/value for background. If a sample exceeds a PRG or proposed background the agencies are still able to make site specific decisions regarding whether an area requires further definition. The determination of a technically justified and agreed upon ambient level for the contaminants at this site needs to be completed prior to any comparison of the data. The values from Schacklette and Boerngen (1984) were derived for the conterminous U.S. and various subregions. Their applicability to the site would need to be determined and justified, therefore the substitution of the upper range value for arsenic would be premature at this time.

Response to Specific Comment no.16: Please see introductory concepts presented in this letter and responses to General Comments 1 through 8 (Group 1) and responses to General Comments 1 through 6 (Group 2). Atlantic Richfield has modified the attached Work Plan to provide only for discrete surface and sub-surface samples to be collected. The concept of background or ambient soil concentrations is important, and Atlantic Richfield will work with the regulatory agencies to establish background soil concentrations for the Process Areas and for the mine site.

Specific Comment no. 17: Page 15. Response to Specific Comment No. 7; 3rd paragraph -- Soil samples to be collected from locations that may be representative of background conditions are identified in associated Work Plans (Waste Rock Areas, Evaporation Ponds and Tailings Areas, Arimetco Heap Leach and Process Components and Cover Materials).

As note in the comment above the determination of agreed upon and technically justified ambient levels of potential contaminants is a critical component to the investigation and cleanup at this site which has not been addressed. In particular the use of the fragmented and uncoordinated approach suggested is not appropriate, and should be replaced with a sound, integrated and technically justified process.

Response to Specific Comment no.17: Please see introductory concepts presented in this letter and responses to General Comments 1 through 8 (Group 1) and responses to General Comments 1 through 6 (Group 2). As stated above, Atlantic Richfield will work with the regulatory agencies to establish background soil concentrations for the Process Areas and for the mine site, and to eliminate any concern over what may appear to be an uncoordinated approach to site investigations at the Process Areas and the mine site.

Specific Comment no. 20: Page 23, Response to Specific Comment No. 10, Comments on Tables, sub comment j -- Atlantic Richfield proposes to evaluate the removal of tank contents and tank removal using the data from the field investigations described in the revised Process Areas Work Plan, and plan to mitigate the tanks will be presented to the regulatory agencies.

Based on the incomplete operational history of the site how will the collection of the composite soil samples provide adequate information for addressing the tank contents and removal at this site? It would appear that more specific sampling would be necessary to address any potential contamination remaining or associated with the tanks.

Response to Specific Comment no.20: Please see introductory concepts presented in this letter and responses to General Comments 1 through 8 (Group 1) and responses to General Comments 1 through 6 (Group 2). The attached Work Plan has been amended to provide specific details of the proposed characterization activities to be conducted during the first phase of the site investigations.

Comments on Revised Table 1 -- Process Areas Sampling Schedule:

Table 1, Process Areas Sampling Schedule: The following are a few examples of the inadequacies of the proposed sampling scheme and rationale. Please refer to the "BLM Sample of Yerington Mine Process Areas Work Plan Outline, April 14, 2003" for examples of the type of sampling information to be included in the final work plan.

Assay Laboratory: The five sub-samples proposed for this building are collected over a lineal distance of 250 feet and over an unknown surface area. One problem with this sampling scheme is that the five samples are being collected over too large an area. What is the basis for this proposal? One acceptable method for characterizing the soils around the assay lab is to first establish an appropriate sampling grid across the areas of interest (service doors, loading dock areas). Both surface and subsurface soil samples are collected at the grid points and composited based on the type of analyses for CoCs including radionuclides (VOCs, SVOCs are collected as discrete samples). Obviously, based on this sampling scheme, more than one sample will be submitted for analysis.

Response to Assay Laboratory Comment: Please see introductory concepts presented in this letter and responses to General Comments 1 through 8 (Group 1) and responses to General Comments 1 through 6 (Group 2). The attached Work Plan calls for four discrete surface samples associated with the Assay Laboratory and three discrete sub-surface samples associated with mapped underground utilities (see Table 1 and Figures 4A and 6B of the Work Plan).

Leach Vats: It is stated that *“The robust construction of the vat walls and floors makes it unlikely that cracks ever developed completely through the structure. The interior of the vats will be inspected for such cracks, however, and if any are observed, these will be recorded and inspected.”* How will cracks in the concrete be inspected? This facility covers an area of over 155,000 sq. ft and yet only 4 samples will be submitted for analysis. The sampling scheme is not supported by rationale. Sub-surface sampling needs to be included as well and radionuclides also need to be included as a CoC.

Response to Leach Vats Comment: Please see introductory concepts presented in this letter and responses to General Comments 1 through 8 (Group 1) and responses to General Comments 1 through 6 (Group 2). The attached Work Plan calls for 10 discrete sub-surface samples associated with the Leach Vats (Table 1 and Figures 4 and 4C). These will be collected using a geoprobe, drilling rig or hollow stem auger rig capable of reaching the appropriate depth below ground surface (about 20 to 25 feet) to allow for samples to be collected below the base of the leach vats (Sec. 2.2, pg. 20).

Filling Station #3: The description of this facility indicates a possible UST exists, yet only five surface sub-samples are proposed to be collected and composited into one sample. A sub-surface investigation at this facility needs to be proposed. Based upon the submitted figures, why weren't monitor wells proposed for underground utilities in this as well as other areas?

Response to Filling Station #3 Comment: Please see introductory concepts presented in this letter and responses to General Comments 1 through 8 (Group 1) and responses to General Comments 1 through 6 (Group 2). The attached Work Plan calls for one discrete surface sample and two discrete sub-surface samples associated with Filling Station #3 and related mapped underground utilities (see Table 1 and Figure 4A and 6B of the Work Plan). The Work Plan has been amended to provide specific details of the proposed characterization activities to be conducted during the first phase of the site investigations

Comment 24: Sampling approach proposed relies on the collection of a minimum of 5 sub-samples to be composited into one composite sample for each component. In most of the components called out in table the five sub-samples include sub-samples from different areas of a component such as a building like the Assay Laboratory. At this component five sub-samples would be collected and composited, including two each from in front of both sets of overhead service doors and one from the loading dock along the northwest side. Since detailed historical information and operational histories are not available, what is the justification for the compositing of the sub-samples from potentially differing usage areas with potentially differing contaminants? Also in those instances where the holding times for an analyte is short, such as VOCs, how will the process of evaluating the composite sample prior to conducting analysis of the individual sub-sample be handled to avoid missing a holding time criteria?

Response to Comment 24: Please see introductory concepts presented in this letter and responses to General Comments 1 through 8 (Group 1) and responses to General Comments 1 through 6 (Group 2). Atlantic Richfield proposes to collect discrete samples and analyze for a full suite of constituents to alleviate concerns such as those presented in this comment.

Specific Comments:

Specific Comment no. 25: Specific Comment No. 5 -- The Proposed Analytical Trigger Levels need to include radionuclides.

Response to Specific Comment 25: The attached Work Plan describes that radionuclide concentrations from the Process Areas will be compared to background concentrations to be developed for the Yerington Mine Site by Atlantic Richfield and the regulatory agencies (Sec. 3.0, pg. 40).

Specific Comment no. 26: Component: Administration Building; Rationale reads: The area where the former fuel island is believed to have been located (Figure 4A) is approximately 40 feet by 40 feet. Therefore, five sub-samples will be collected and composited from within this area, and analyzed for TPH (GRO and DRO).

What is the basis for the area delineated as being 40 by 40 feet and is the proposed sampling using five clustered sub-samples the most effective sampling approach versus transects?

Response to Specific Comment 26: Please see introductory concepts presented in this letter and responses to General Comments 1 through 8 (Group 1) and responses to General Comments 1 through 6 (Group 2). The attached Work Plan calls for one discrete surface sample associated with the Administration Building and four discrete sub-surface samples associated with mapped underground utilities (see Table 1 and Figures 4A and 6B of the Work Plan). No sub-samples will be collected and composited. The area where the former fueling station may have existed will be investigated by utility locating detection devices and, if necessary, excavation (Sec. 3.1, pg.46-47).

Specific Comment no. 27: Component: Change House: Rationale reads: A small room at the north end of the building was a former laboratory. No chemicals are present in the lab, No solvents were stored there. There is no reason to believe that any potential contaminants other than those associated with the laboratory (e.g. small amounts of acids and inorganic lab chemicals) would be present at this location.

Unless a detailed operational history of the chemicals used in the laboratory is available the analytes should include VOCs and SVOCs. Also the sampling notes that two of the samples would be collected in front of the doorway and three outside of the building. Does this mean that the two in the building would be of the flooring material which is not described and three would be soil samples? How comparable would this data be?

Response to Specific Comment 27: Please see introductory concepts presented in this letter and responses to General Comments 1 through 8 (Group 1) and responses to General Comments 1 through 6 (Group 2). The attached Work Plan calls for two discrete surface samples associated with the Change House (see Table 1 and Figure 4A of the Work Plan). No sub-samples will be collected and composited. All samples for the Change House and other buildings are located outside the buildings. Buildings with dirt floors will have samples collected from inside the building (Table 1).

Specific Comment no. 28: Component: Assay Laboratory: Rationale reads: Therefore, analyses will be for ABA, WRA, VOC, TPH, (DRO) and PCB.

Based on the description provided in the rationale, deleting an analysis of SVOCs is not justified unless a detailed operational history for the building is available.

Response to Specific Comment 28: Please see introductory concepts presented in this letter and responses to General Comments 1 through 8 (Group 1) and responses to General Comments 1 through 6 (Group 2). The attached Work Plan calls for four discrete surface samples associated with the Assay Laboratory and two discrete sub-surface samples associated with mapped underground utilities (see Table 1 and Figures 4A and 6B of the Work Plan). SVOCs from these samples will be analyzed.

Specific Comment no. 29: Component Carpenter Shop: Rationale reads: A small concrete sump with a valve is present outside the west wall of the building. There is no indication that the building was ever used for other activities other than for carpentry work, thus is no reason to believe that any potential contaminants of concern were ever used or stored in the shop.

The presence of a small concrete sump potentially invalidates the argument that only simple carpentry was involved. Unless a more detailed operational history is available sampling needs to be evaluated.

Response to Specific Comment 29: Please see introductory concepts presented in this letter and responses to General Comments 1 through 8 (Group 1) and responses to General Comments 1 through 6 (Group 2). The attached Work Plan calls for one discrete surface sample associated

with the Carpenter Shop sump and two discrete sub-surface samples associated with mapped underground utilities (see Table 1 and Figures 4B and 6A of the Work Plan).

Specific Comment no. 30: Component: Sheet Metal Shop: Rationale reads There is no indication that the building was use for any purpose other than as a sheet metal shop. Therefore, analyses will be for TPH (DRO).

In most sheet metal shops solvents would be used to clean metal surfaces, acids to pickle a surface for preparation, and welding operations that could use welding rods could take place. Therefore unless a more detailed operational history is available the analytes should include metals, VOCs and SVOCs, along with the called out TPH.

Response to Specific Comment 30: Please see introductory concepts presented in this letter and responses to General Comments 1 through 8 (Group 1) and responses to General Comments 1 through 6 (Group 2). The attached Work Plan calls for two discrete surface samples associated with the Sheet Metal Shop and three discrete sub-surface samples associated with mapped underground utilities (see Table 1 and Figures 4A and 6B of the Work Plan). VOCs and SVOCs from these samples will be analyzed.

Specific Comment no. 31: Component: Motor Cargo Building: Rationale reads: Since Weed Heights is currently conducting operations in and around the building, any laboratory analytical results from samples collected at this component could be potentially representative of activities conducted by Weed Heights personnel or equipment. (No sampling is proposed based on this assumption?)

The purpose of the investigation to is determine potential releases to the environment rather than attribution of the responsible party for a particular source. Since the component was used by ARC in the past the activities, potential contamination need to be assessed even if the attribution is uncertain. Therefore sampling of the component is necessary.

Response to Specific Comment 31: Please see introductory concepts presented in this letter and responses to General Comments 1 through 8 (Group 1) and responses to General Comments 1 through 6 (Group 2). The attached Work Plan calls for four discrete surface samples associated with the Motor Cargo Building (see Table 1 and Figure 4F of the Work Plan). Analyses will be conducted for the full range of potential contaminants.

Specific Comment no. 32: Component: Former Calcine Ditch: Rationale reads: Therefore, sub-samples will be collected and composited near the source at the Acid plant and also approximately 3,400 downstream along the ditch.

Such a compositing approach for a long linear feature such as the unlined Calcine Ditch is not appropriate for sampling. An approach similar to that used for the vat leach tanks would be more appropriate.

Response to Specific Comment 32: Please see response to General Comment no. 14 (Group 2). Samples will be collected every 200 feet along the approximate 2,000-foot length of the ditch not covered by the Arimetco heap.

Specific Comment no. 33: Component: Surface Pumps Foundation: Rationale reads The potential contaminants of concern near this structure are sulfuric acid and metals associated with surface runoff over tailings.

The proposed analytes do not take into account the potential use of lubricants for the pumps or diesel units to power the pumps. The analyte list should be expanded to add TPH (DRO).

Response to Specific Comment 33: Please see introductory concepts presented in this letter and responses to General Comments 1 through 8 (Group 1) and responses to General Comments 1 through 6 (Group 2). The attached Work Plan calls for one discrete surface sample associated with the foundations for surface pumps (see Table 1 and Figure 2 of the Work Plan). TPH (DRO) for these samples will be analyzed. Since the pumps were apparently positioned over the concrete holding tank for the purpose of moving water, any leakage of lubricant from the pumps would have been either contained within the large holding tank or diluted by incoming water and pumped out through piping or mixed into water near the inlet grate, where a sample is proposed.

Comments on Proposed Process Areas Groundwater Monitoring Plan:

General Comments

General Comment no. 34: As EPA has stated in comments to the Groundwater Conditions Work Plan, conducting monitoring activities on a quarterly basis for a period of only one year will not provide sufficient data to characterize temporal and spatial trends in groundwater flow directions and COC fate and transport. A longer monitoring time frame is recommended.

Response to General Comment no. 34: Atlantic Richfield agrees with this comment and anticipates groundwater monitoring (water level measurements and sample collection and analysis) will be conducted for an extended period of time, to be agreed upon with the regulatory agencies. Please note that an initial groundwater monitoring program associated with the Process Areas is proposed for implementation under the attached Work Plan (Sec. 3.1, pg. 47). In addition to the sub-surface sampling of underground utilities in the Process Areas, Atlantic Richfield proposes to install three groundwater monitoring wells in the Process Areas. One of these will be installed as close as possible to the buried former acid plant in a down-gradient

location (see Figure 7 of the attached Work Plan). Atlantic Richfield proposes to discuss the timing and design of these monitoring wells with the regulatory agencies in an upcoming meeting, possibly as part of discussions related to finalizing the Draft Final Groundwater Conditions Work Plan.

General Comment no. 35: Once the initial groundwater flow and water quality data have been collected and evaluated, “hydropunch” or “vertical profiling” technologies could be used to further delineate potential contaminant plumes and help identify which groundwater zones to monitor with wells. This may help limit the number of new monitoring wells required.

Response to General Comment no. 35: Atlantic Richfield agrees with this comment and will discuss such activities with the regulatory agencies at the appropriate time, such as during the a possible second phase of site investigations at the Process Areas or discussions related to the Groundwater Conditions Work Plan.

General Comment no. 36: The Agencies agree with the approach to install three monitoring wells initially to determine groundwater flow direction, however, given the lack of groundwater data in this area it may be difficult to target appropriate groundwater zones without some use of hydropunch or vertical profiling technologies. Also, the exact number of wells should be determined by the data requirements. For example, it is very likely that more than one groundwater zone will require monitoring. Also, how will ARC monitor the southwestern boundary of the Process Area? This appears to be a data gap, given the Megapond to the SW as well as the old processing plant (now covered by the heap leach). Also given the size of the Process Components Areas more than one monitoring well such as PAMW-6 may be required. What is the basis for the assumed sizes of potential plumes justifying the spacing used for the monitoring wells on the perimeter of the area?

Response to General Comment no. 36: Atlantic Richfield agrees with the concepts provided in this comment, and will discuss such activities with the regulatory agencies at the appropriate time (i.e., discussions related to the installation of the three proposed monitoring wells in the attached Work Plan and the monitoring proposed in the Draft Final Groundwater Conditions Work Plan). The phased approach to site investigations, to be based on information gathered from the initial well installations, will allow for a defensible approach to the evaluation of groundwater conditions associated with the Process Areas.

General Comment no. 37: Due to the location of the Process Areas Components in the central portion of the mine operations, with surrounding and adjacent mining operations, how will the potential contamination from contaminant sources in these other areas be taken into consideration? The proposed monitoring well PAMW-1 lies down gradient from Arimetco's Electro Winning Processing area. Wouldn't this make it difficult to determine an appropriate

background level?

Response to General Comment no. 37: Atlantic Richfield agrees with this comment and will discuss the timing and design of this monitoring location with the regulatory agencies in an upcoming meeting, possibly as part of discussions related to finalizing the Draft Final Groundwater Conditions Work Plan. The attached Work Plan presents a more suitable location for a potential up-gradient monitoring well, which can be subsequently modified (see Figure 7 of the attached Work Plan).

General Comment no. 38: Figure 1, minor comment: The old processing plant, SS, is not identified in the key for Figure 1.

Response to General Comment no. 38: Figure 4 of the attached Work Plan shows the location of the former acid plant.

General Comment no. 39: Process Areas Groundwater Monitoring Plan -- ARC's proposed groundwater monitoring plan for the process areas is insufficient to monitor the entire process areas. For example, the proposed first phase of the groundwater monitoring plan includes the installation of three wells (PAMW -1, -2 and -3) that will be used to establish the hydraulic gradient as well as provide geochemical characterization of the alluvial groundwater up- and down-gradient of the process areas. What appears to be indicated is that these wells will be constructed across the first encountered aquifer. Is this true? Is there information that indicates that only one aquifer should be monitored? In the past ARC has insisted that there is more than one aquifer and that contamination is contained within the first aquifer. If the aquifer is in a fluvial depositional setting, then how can these three wells determine whether there is contamination below the first aquifer? Doesn't it seem probable that more than three wells will be necessary to monitor aquifers below the first?

Proposed monitor wells PAMW -2, -3 and -4 are spaced approximately 800 and 1,000 ft apart from each other, so how can they determine whether filling stations #1, #2 and #3 (Facility ID# U, X, W), located approximately 2,000 ft up-gradient from these three wells has sourced CoCs to groundwater? Dilution and the preferential groundwater pathway of CoCs must certainly be involved when such large distances from monitoring are proposed. Also, the proposed 1-yr monitoring of these wells is not supported. Some CoCs may not be as mobile as others, so it will take longer for these CoCs to impact groundwater. Based upon the submitted figures, why aren't the proposed monitor wells located closer to the actual underground utilities such as fuel lines, spent and acid lines that were known to carry CoCs?

The Agencies agree with ARC that the groundwater monitoring proposal should be integrated with the site-wide groundwater evaluation anticipated by the Groundwater Conditions Work Plan. Again, a number of monitor wells were to be proposed, along with the appropriate

Mr. Arthur G. Gravenstein
Nevada Division of Environmental Protection
December 15, 2003
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rationale, in lieu of sub-surface sampling of the utility lines only and were not intended to replace all subsurface sampling for all process areas components. Detailed subsurface soil sampling will have to be presented in the final work plan. Please refer to the "BLM Sample of Yerington Mine Process Areas Work Plan Outline, April 14, 2003" for examples of the type of sampling information to be included in the final work plan.

Response to General Comment no. 39: Atlantic Richfield agrees that the groundwater monitoring plan attached to the August 7, 2003 response to comments submittal may be insufficient to monitor the entire process areas. As discussed in the July 7, 2003 meeting with the regulatory agencies, the groundwater monitoring plan was proposed as an initial phase of what may become a more comprehensive monitoring network associated with the Process Areas, and with the overall groundwater conditions at the mine site. As discussed in the July 7, 2003 meeting, Atlantic Richfield agrees with the concept of installing groundwater monitoring wells in a phased manner that will optimize the location and design of the wells (Sec. 3.1, pg. 47-48). Atlantic Richfield has also committed to detailed sub-surface sampling as suggested by the BLM.

Atlantic Richfield anticipates that our responses to comments and the attached Process Areas Work Plan will be satisfactory for agency approval. Please contact me at your earliest convenience at 1-406-782-9964 ext. 433 to schedule a meeting date.

Sincerely,

A handwritten signature in cursive script, appearing to read "Chuck Zimmermann for".

Dan Ferriter, P.E.
Environmental Manager